

Lecture.

Liquid Mixtures

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Mixtures

- ❖ A mixture is a material system made up by two or more different substances which are mixed together but are not combined chemically.
- ❖ The air is a mixture of gases, largely nitrogen, oxygen, and carbon dioxide, along with smaller percentages of other substances

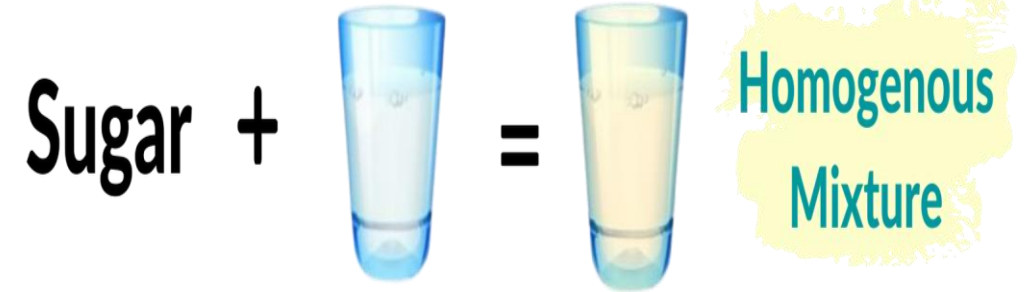
Liquid Mixtures

❖ There are 4 types:

1. Solutions
2. Suspensions
3. Colloids
4. Emulsions

A homogeneous & A heterogeneous mixture

❖ A homogeneous is a substance that is uniform in composition



❖ A heterogeneous mixture of large solid substance in another substance made by mechanical agitation



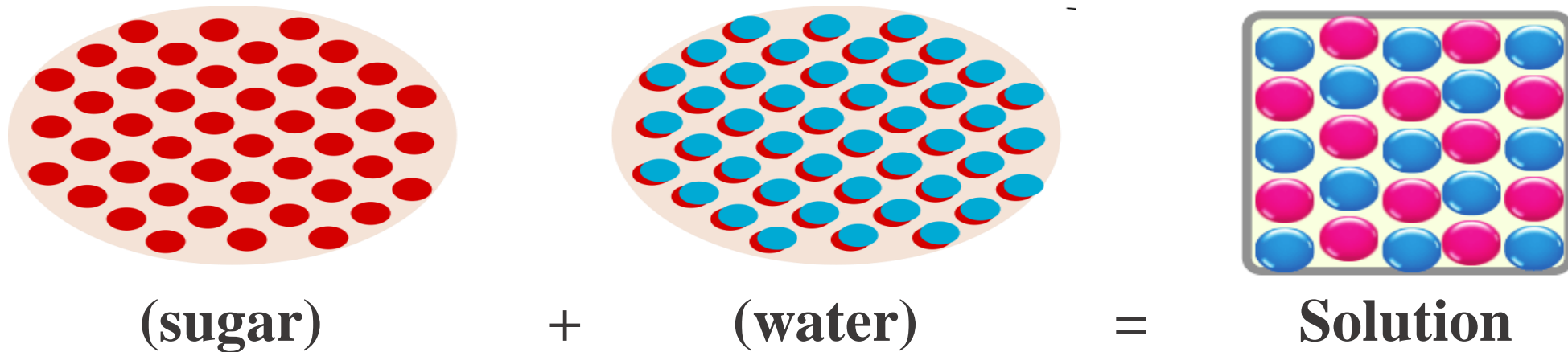
Solutions

- ❖ A solution is a homogeneous (A substance that is uniform in composition) mixture of one or more substances called solutes dissolved in another substance called the solvent.
- ❖ The **solute** can be **solid, liquid, or gas** but the **solvent** is always a **liquid**. E.g. salt solution, sugar solution

Solution

When the 2 substances totally mix it is called a solution

E.g. Solute + Solvent = Solution



❖ We then say sugar is soluble in water, it has dissolved

❖ An aqueous solution is one in which water is the solvent.

Properties of a Solution

- 1) Consists of a solute and a solvent
- 2) Have variable composition.
- 3) Clear
- 4) Homogenous
- 5) Do not settle.
- 6) Can be separated by physical properties.
- 7) Can pass through filter paper.

Suspensions

- ❖ A suspension is a heterogeneous mixture of large solid substance in another substance made by mechanical agitation.
- ❖ The substances distributed in the background material is not dissolved and will settle out unless the mixture is constantly shaken.

- ❖ The size of the particles is great enough so they are visible to the naked eye
- ❖ The solute is always a solid substance but the solvent can be solid, liquid, or gas. E.g. mud in water, flour in water, some medicines, dust or water in air

Properties of a Suspension

- 1) Consists of a solid in a solvent.
- 2) Heterogeneous.
- 3) Not clear
- 4) Settle
- 5) Do not pass through filter paper or membranes.

Examples of Suspensions



Chocolate milk



**Homemade
Lemonade**



**Homemade Pink
Lemonade**

Colloids

- ❖ Is a homogeneous solution with intermediate particle size between a solution and a suspension.
- ❖ The **solute** can be **solid, liquid, or gas** substance AND the **solvent** can also be **solid, liquid, or gas**. E.g. Foam (Whipped cream), Gel (jelly), smoke, blood

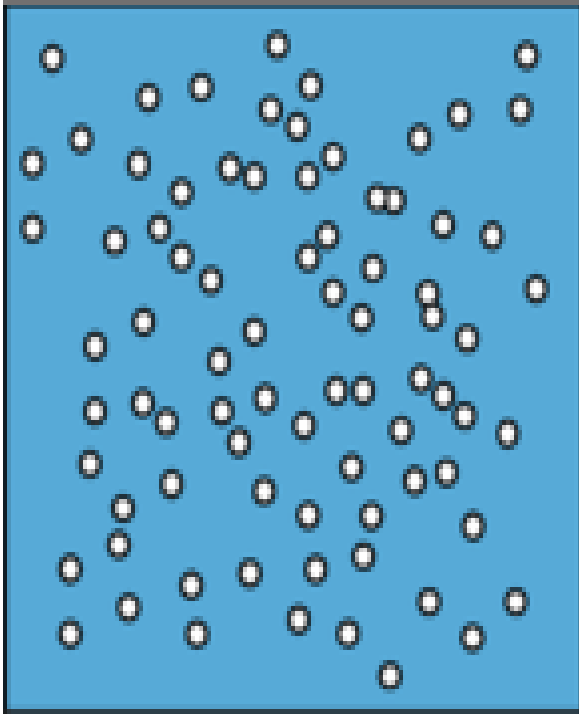
examples of Colloids



Properties of a Colloid

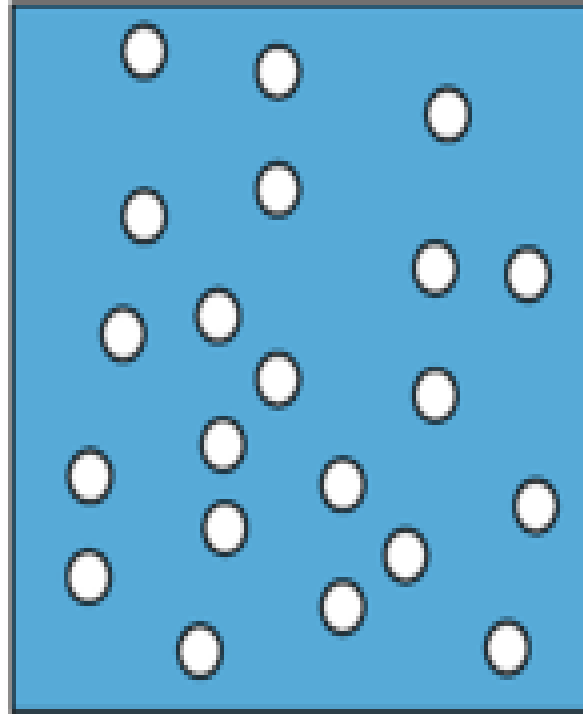
- 1) Can be homogenous
- 2) Do not settle
- 3) Pass through filter paper but NOT membranes

Particle size less than
 10^{-7} cm



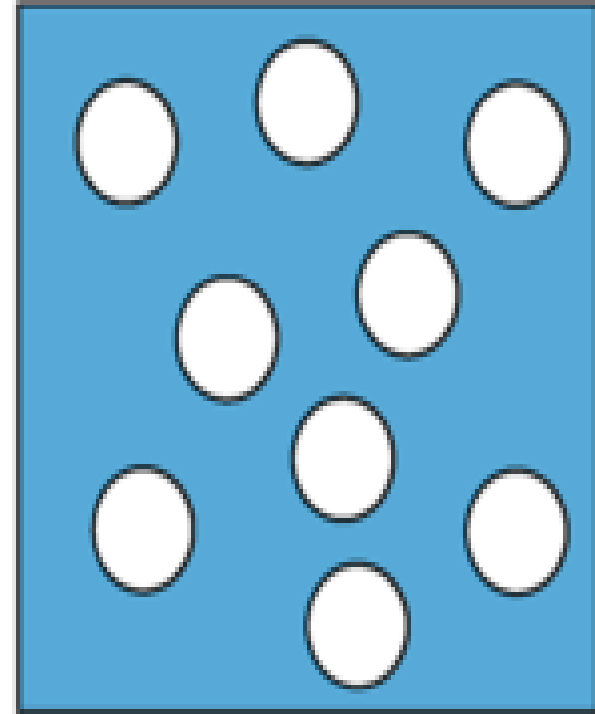
True Solution

Particle size between
 10^{-7} cm and 10^{-5} cm



Colloidal Solution

Particle size greater than
 10^{-5} cm



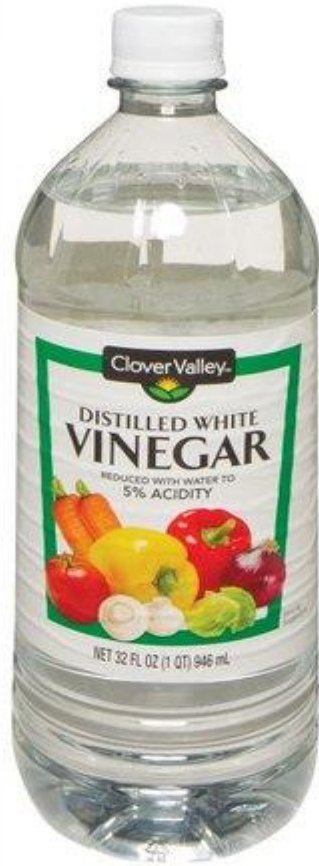
Suspensions

Emulsions

- ❖ Emulsion is a mixture consists of two or more liquids that do not mix.
- ❖ There are two kinds of emulsions. An emulsion that settles is called temporary emulsion. An emulsion that doesn't is called permanent emulsion.

E.g. oil and vinegar.

Examples of Emulsions



vinegar



oil

Any Question?